

Comment: Michael Toman

In their paper, Fankhauser and Stern (hereafter FS) do a fine job of demonstrating the urgent need to address the threat of global climate change, a view that I very much share. Climate change will be a particular threat for World Bank client countries with greater vulnerabilities due to their location (e.g., in low-lying coastal areas); the prevalence of at-risk sectors in their economic activity (e.g., low-productivity subsistence agriculture); a lower level of access to more resilient technologies; and less developed institutional capacities for adapting to climate change (e.g., in delivering public health programs). Similar arguments have also been made in a flagship report by the Bank on climate change and poverty risks (Hallegatte et al. 2016). Although many of the major risks will materialize in the future, inertia in the earth's climate system and in the adjustment of capital stocks in the economy mean that actions need to start in earnest now to stem the risks, even though their magnitudes are uncertain.

FS also argue that now is the time for a major push to stem climate change risks through deep and rapid cuts in global greenhouse gas emissions. For reasons described below, I am less sanguine about this possibility—though I would be glad to be wrong. FS base their conclusion on several premises:

1. The ethical argument for the responsibility of this generation to protect future generations from the serious adverse effects of climate change is unambiguous.
2. The political aspects of obtaining international agreement on concerted action to mitigate greenhouse gas emissions have become more favorable (New Climate Economy 2015), particularly in light of the Paris Agreement established at the United Nations conference on climate change in late 2015 (UNFCCC 2015, Addendum).

3. Rapid decarbonization can be undertaken in ways that actually create economic opportunity over the medium and longer terms, for developing and developed countries alike, through new opportunities for technical advance and creation of markets for new goods and services (New Climate Economy 2014).
4. There are near-term benefits of mitigating greenhouse gas emissions as well—most notably, “co-benefits” obtained when switching to renewable energy and improving energy efficiency reduce local pollutants from fossil fuel burning that damage human health and the environment.

With respect to the first point, I do not think there is yet a widely shared view of what it means in practice to assume an intergenerational responsibility. Is the obligation of the current generation to do as much as possible to mitigate cumulative emissions in an attempt to forestall catastrophic impacts of climate change, an option discussed in (Barrett 2013)? What is the responsibility to reduce noncatastrophic risks as well? Are there different ethical obligations between mitigating greenhouse gas emissions and strengthening resilience to climate change?

Greater complexity comes in addressing unavoidable questions about how nearer-term costs of emissions mitigation and improved resilience to climate change are to be shared among members of the current generation. Almost 25 years of analytical work and policy wrangling have not led to practical resolution of the burden-sharing issue, other than the general recognition that better-off countries should carry more of the burden. Funding for cost-sharing remains inadequate, and there continues to be advocacy for expensive low-carbon energy projects in low-income developing countries whose contributions to global emissions are minimal.

With respect to the second point, the degree of engagement among developing and developed countries in the 2015 Paris Agreement is indeed a significant achievement. Going forward, it remains to be seen how well countries do in implementing their “Nationally Determined Contributions” (NDCs) to reducing global greenhouse gas emissions. Moreover, mitigating the serious risks from climate change will require substantially deeper cuts than will follow even under full implementation of NDCs. The basic paradox of international agreements holds: Finding ways to agree on and deliver significant mitigation commitments across many countries is quite difficult.

With respect to the third point, analysis reported in the most recent IPCC assessment indicates relatively modest cumulative effects on consumption over time from greenhouse gas mitigation, *if* everything goes right (IPCC 2014, table SPM2). That means the ready availability *and* public acceptance of cost-effective decarbonization technologies that remain controversial (notably geological carbon sequestration, as well as greatly expanded nuclear power). It also means extremely cost-effective coordinated implementation of national policies to curb greenhouse gas emissions. Costs are considerably higher if these strong assumptions do not hold.

Beyond these challenges, it is important to be circumspect about the economics of rapidly and massively scaling up decarbonization. A great deal can be accomplished with improvements in energy efficiency. On the other hand, although solar power in particular seems to be increasingly inexpensive these days, the cost of overcoming intermittency—through combinations of back-up fossil fuel generation, smart grids (which help only for uncorrelated intermittency), and evolving but still-costly storage—also must be taken into account.

The 2014 New Climate Economy report makes much of the broader possibilities for “creative destruction” from more stringent limits on greenhouse gas emissions, leading to economic gains from increased innovation and new markets. I think the breadth of applicability of this argument needs further validation. Although retiring a significant amount of fossil-fuel-based power generation capacity would lead to expanded markets for replacement technologies and competitive gains for some suppliers, such a policy is not likely to be a near-term win across the board. How much innovation would take place also depends critically on the extent to which greenhouse gases are appropriately priced, and what complementary policies for supporting basic and applied R&D are deployed.

The fourth point is a popular argument in climate policy debates, but I think we need to consider more carefully the economic and ethical aspects of counting environmental co-benefits as an argument for greenhouse gas mitigation. Developing countries currently face numerous environmental challenges, including major public health threats from air pollution. However, air pollution can be reduced cost-effectively with established technologies, without the delay or uncertain cost associated with scaling-up low-polluting renewable alternatives to fossil energy. Why not make the strong economic case for cutting these emissions anyway, regardless of

what is done with respect to low-carbon energy? From an ethical perspective, there are intense debates about who has a greater responsibility to pay for steps to cut current greenhouse gases in order to protect the welfare of future generations. What can we say about the morality of not pushing for readily available and relatively affordable life-saving pollution control measures today?

FS make the valid and important point that macro and micro scales of analysis need to be better integrated for assessing greenhouse gas mitigation possibilities and for enhancing resilience to climate change. What is needed is more of an “environmental macroeconomics” than is currently within the scope of environmental and natural resource economics. They also argue that at this juncture, it is important to “get the big decisions right”—like how to implement carbon pricing and increase assistance for adaptation measures.

To have a realistic chance to make the deep cuts in future global greenhouse gas emissions that FS rightly advocate, the development of a favorable technological environment is crucial. There is a vital need especially to provide more cost-competitive low-carbon energy technology options. Low-carbon energy sources—renewables, nuclear, and fossil energy use with carbon capture and storage—must increase from less than 20 percent of total energy use to more than 70 percent or even 90 percent by 2100, depending on the stringency of the limit on temperature increase sought (IPCC 2014, figure 7.16). Such a transformation will not be possible without fundamental changes in the cost and performance of low-carbon energy technologies.

The call by some prominent observers (including Stern) for a “Global Apollo Programme to Tackle Climate Change” (King et al. 2015) draws welcome attention to the need for greatly expanding international R&D for greenhouse gas mitigation. The proposal is to do this through voluntary participation in a kind of “Low-Carbon Technology Innovation Club.” Keohane and Victor (2016) describe in more detail such an approach for international cooperation to develop technologies needed for deep cuts in greenhouse gas emissions, as part of a larger framework for different types of climate change policy coordination. However, the initial target proposed by King et al. (2015) of \$15 billion per year, or about 0.02 percent of global GDP, is roughly an order of magnitude smaller than the required investment levels per year that the International Energy Agency has calculated to

be necessary for a low-carbon transition (IEA 2014). How to mobilize such large sums of money in order to make rapid and deep cuts in global greenhouse gas emissions is an urgent but still-unanswered question.

References

- Barrett, Scott. 2013. "Climate Treaties and Approaching Catastrophes." *Journal of Environmental Economics and Management* 66 (2): 235–250.
- Hallegatte, Stephane, Mook Bangalore, Laura Bonzanigo, Marianne Fay, Tamaro Kane, Ulf Narloch, Julie Rozenberg, David Treguer, and Adrien Vogt-Schilb. 2016. *Shock Waves: Managing the Impacts of Climate Change on Poverty*. Washington, DC: World Bank.
- IEA (International Energy Agency). 2014. *World Energy Investment Outlook*. Paris: International Energy Agency. <https://www.iea.org/publications/freepublications/publication/WEIO2014.pdf>.
- IPCC (Intergovernmental Panel on Climate Change). 2014. *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
- Keohane, Robert, and David Victor. 2016. "Cooperation and Discord in Global Climate Policy." *Nature Climate Change* 6 (6): 570–575.
- King, David, John Browne, Richard Layard, Gus O'Donnell, Martin Rees, Nicholas Stern, and Adair Turner. 2015. "A Global Apollo Programme to Combat Climate Change." London: London School of Economics, Centre for Economic Performance. http://cep.lse.ac.uk/pubs/download/special/Global_Apollo_Programme_Report.pdf.
- New Climate Economy. 2014. *Better Growth, Better Climate: Charting a New Path for Low-Carbon Growth and a Safer Climate*. London: Global Commission on the Economy and Climate. <http://newclimateeconomy.report/2014/>.
- New Climate Economy. 2015. *Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate*. London: Global Commission on the Economy and Climate. <http://newclimateeconomy.report/2015/>.
- UNFCCC (United Nations Framework Convention on Climate Change). 2015. "Report of the Conference of the Parties on Its Twenty-First Session," Paris, November 30–December 15, Addendum. Document FCCC/CP/2015/10/Add.1. <http://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf>.

This is a section of [doi:10.7551/mitpress/11130.001.0001](https://doi.org/10.7551/mitpress/11130.001.0001)

The State of Economics, the State of the World

Edited by: Kaushik Basu, David Rosenblatt,
Claudia Sepúlveda

Citation:

The State of Economics, the State of the World

Edited by: Kaushik Basu, David Rosenblatt, Claudia Sepúlveda

DOI: 10.7551/mitpress/11130.001.0001

ISBN (electronic): 9780262353472

Publisher: The MIT Press

Published: 2020



The MIT Press



This work is available under the Creative Commons Attribution—NonCommercial—NoDerivatives 3.0 IGO license (CC BY-NC-ND 3.0 IGO) <http://creativecommons.org/licenses/by-nc-nd/3.0/igo>.

Some rights reserved

The findings, interpretations, and conclusions expressed in this work are those of the authors and do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy, completeness, or currency of the data included in this work and does not assume responsibility for any errors, omissions, or discrepancies in the information, or liability with respect to the use of or failure to use the information, methods, processes, or conclusions set forth. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Nothing herein shall constitute or be construed or considered to be a limitation upon or waiver of the privileges and immunities of The World Bank, all of which are specifically reserved.

Attribution—Please cite the work as follows: The World Bank. 2019. *The state of economics, the state of the world* / edited by Kaushik Basu, Claudia Sepulveda, and David Rosenblatt. Published by MIT Press. © World Bank. License: Creative Commons Attribution—NonCommercial—NoDerivatives 3.0 IGO (CC BY-NC-ND 3.0 IGO).

Third-party content—The World Bank does not necessarily own each component of the content contained within the work. The World Bank therefore does not warrant that the use of any third-party-owned individual component or part contained in the work will not infringe on the rights of those third parties. The risk of claims resulting from such infringement rests solely with you. If you wish to re-use a component of the work, it is your responsibility to determine whether permission is needed for that re-use and to obtain permission from the copyright owner. Examples of components can include, but are not limited to, tables, figures, or images.

All queries on rights and licenses should be addressed to the Publishing and Knowledge Division, The World Bank, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; e-mail: pubrights@worldbank.org.

This book was set in Stone Serif and Stone Sans by Westchester Publishing Services. Printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Names: Basu, Kaushik, editor. | Sepúlveda, Claudia Paz, 1969– editor. | Rosenblatt, David, editor.

Title: *The state of economics, the state of the world* / edited by Kaushik Basu, Claudia Sepulveda, and David Rosenblatt.

Description: Cambridge, MA : MIT Press, [2019] | Includes bibliographical references and index.

Identifiers: LCCN 2018046336 | ISBN 9780262039994 (hardcover : alk. paper)

Subjects: LCSH: Economic development. | Information technology—Economic aspects. | Monetary policy. | Social change.

Classification: LCC HD82 .S8223 2019 | DDC 330.1—dc23

LC record available at <https://lcn.loc.gov/2018046336>

10 9 8 7 6 5 4 3 2 1